

## PATENT APPLICATION TRANSMITTAL LETTER

Docket No.

65431 U.S. PTO  
08/854691**To the Commissioner of Patents and Trademarks:**

Transmitted herewith for filing is the patent application of:

Giancarlo CIPRIANI

entitled: MECHANISM FOR BRAKING THE UNWINDING OF A BUNDLE OF  
METALLIC WIRE IN A DRUM

Enclosed are:


- ☒ one sheet of formal drawings.
- ☒ an executed declaration of the inventor.
- ☒ an assignment of the invention to C.I.F.E. S.P.A.
- ☒ a certified copy of an Italian application.
- ☒ a verified statement to establish small entity status under 37 CFR 1.9 and 1.27.
- ☐ preliminary amendment.
- ☐ Information Disclosure Statement.
- ☐ other: .

**CLAIMS AS FILED**

	NO. FILED	NO. EXTRA	RATE	FEE
BASIC FEE			\$ 770	\$ 770
TOTAL CLAIMS	4 - 20 =	0	X\$ 22	0
INDEPENDENT CLAIMS	1 - 3 =	0	X\$ 80	0
MULTIPLE DEPENDENT CLAIM PRESENT			\$ 260	
<b>TOTAL</b>				\$
If applicant has small entity status under 37 CFR 1.9 and 1.27, then divide total fee by 2, and enter amount here.				
<b>SMALL ENTITY TOTAL</b>				\$ 385

- ☒ A check in the amount of \$425 to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. 25-0120 as described below. I have enclosed a duplicate copy of this sheet.
- ☐ Charge the amount of \$\_\_\_ as filing fee.
- ☒ Credit any overpayment.
- ☒ Charge any additional filing fees required under 37 CFR 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 CFR 1.18 at the mailing of the Notice of Allowance, pursuant to 37 CFR 1.311(b).

May 12, 1997



Robert J. Patch  
Registration No. 17,355  
745 South 23rd Street  
Arlington, VA 22202  
Telephone 703/521-2297

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May 12, 1997



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**VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS**  
**(37 CFR 1.9(f) & 1.27(c))--SMALL BUSINESS CONCERN**

Docket Number (Optional)

Applicant or Patentee: C.I.F.E. S.P.A. (Giancarlo CIPRIANI)

Serial or Patent No.: \_\_\_\_\_

Filed or Issued: \_\_\_\_\_

Title: MECHANISM FOR BRAKING THE UNWINDING OF A BUNDLE OF METALLIC WIRE IN A DRUM

I hereby declare that I am

- ☐ the owner of the small business concern identified below:
- ☒ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF SMALL BUSINESS CONCERN C.I.F.E. S.P.A.ADDRESS OF SMALL BUSINESS CONCERN 70/72 Loc; Fontechiara, Frz. Corsalone  
I-52010 CHIUSI DELLA VERNA - AREZZO (I)

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.12, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees to the United States Patent and Trademark Office, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention described in:

- ☒ the specification filed herewith with title as listed above.
- ☐ the application identified above.
- ☐ the patent identified above.

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights in the invention must file separate verified statements averring to their status as small entities, and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e).

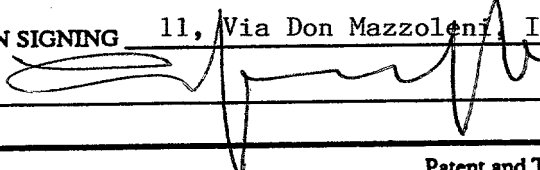
Each person, concern or organization having any rights in the invention is listed below:

- ☒ no such person, concern, or organization exists.
- ☐ each such person, concern or organization is listed below.

Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING Giancarlo CIPRIANITITLE OF PERSON IF OTHER THAN OWNER Chairman of the Board of DirectorsADDRESS OF PERSON SIGNING 11, Via Don Mazzoleni, I-52012 Bibbiena - Arezzo (I)SIGNATURE  DATE 10 April 1997

# MECHANISM FOR BRAKING THE UNWINDING OF A BUNDLE OF METALLIC WIRE HOUSED IN A DRUM

## BACKGROUND OF THE INVENTION

5

### Field of the Invention

The invention concerns a mechanism for the braking of the unwinding of a bundle of metallic wire housed in a container drum and aimed particularly at feeding soldering machines, in particular those operating continuously, with automatic advancing of the wire that constitutes the weld metal.

### Description of the Prior Art

Coils of metal wire are used, particularly in the field of continuous soldering machines, where said wire is unrolled and carried to the soldering point where it is melted to join the two parts to be soldered.

When the quantity of wire being used is large, instead of being wound in rolls of a few kilogrammes in weight, the metallic wire, is contained as a bundle of various quintals inside a drum with a positioning cylindrical core, so that it is capable of feeding the soldering machine for a long period of time, eliminating in this way its frequent stoppage due to lack of the same soldering wire.

This type of feeder drum is positioned, when operative, with its axis in vertical position and the wire of the bundle is pulled up by a dragging unit. Due to the extreme elasticity of the wire and of its

tendency to straighten out, when it is pulled towards the outside, various turns tend to rise together and they can become tangled among each other so as to provoke the stoppage of its advancement. This inconvenience is being presently avoided by the use of a crown shaped weight, placed inside the drum and on the bundle of wire with the aim of avoiding the rising of various turns at the same time and therefore their tangling up.

However, there is a clearance between said crown and the inner surface of the drum's contour and between the crown and the surface of the inner tubular trunk which keeps the bundle in position, without said clearance, due to the fact that the drums are not strictly identical to one another, the crown shaped weight could adhere to said surfaces and not slide enough to maintain itself adherent to the bundle, as the wire is used, or could impede the unwinding of the wire because of the pressure placed on the contours of the drum where it adheres, and would end up by carrying out a blockage on the wire that should instead move forward.

If instead the crown shaped weight should have a relatively ample clearance compared to the internal surface of the drum and of the internal tubular trunk, the movement of the coils at the top of the bundle, determined by the unrolling movement, could bring said turns or parts of them above the pressure disk and interact with it to form a knot, therefore blocking the unwinding of the bundle and consequently of the soldering machine.

### SUMMARY OF THE INVENTION

Taking the disadvantages and problems of the above technique into consideration, consequently one of the main aims of this invention  
5 is to find a device which can stop the turns of the bundle inside the feeding drum from lifting from the bundle itself. This to avoid the tangling up of the wire that would stop the wire feeding unit therefore also the soldering machine.

Another aim of this invention is to find a device that can act on  
10 drums that are not strictly identical and that can avoid that one or more coils should pass over the device itself and therefore get tangled on it causing the advancement of the wire from the bundle which is being unrolled, to stop.

A further aim is to realise a low cost relatively light device, capable  
15 of carrying out a non excessive but regular braking action in time, while the bundle unwinds. This to avoid stress on the unit that pulls the wire from the bundle to allow an even pull towards the welding point to allow a uniform soldering in time.

An invention that can reach said results is particularly  
20 advantageous because it allows the use of drums containing metal wire bundles of various sizes. It allows the correct unwinding of the bundles, without the tangling up of the wire, and a correct feed of the non stop welding machines so that these latter ones can carry out uniform and sized welds as foreseen while making the project.

25 This means without waste due to anomalous feed of the welding

wire.

The invention which allows us to obtain said results consists in a circular crown shaped device, equipped with jutting flexible stirrup shaped elements on the external rim. The size of these elements is such that they can adhere, eventually by inflecting, on to the inner surface of the drum within which it will be placed. On its inner rim the crown is also equipped with guiding winglets and flexible tabs oriented in an almost tangential direction in respect to the tubular trunk placed at the center of the drum, such as to reach it to block the lifting from the bundle of turns and therefore to avoid their tangling and consequently to help guide the wire as it is pulled and unwound from the bundle to the outside of the drum.

The stirrup shaped elements, placed on the outside of the circular crown shaped structure, are such as to avoid the wire from the bundle to pass over from the external edge of the invention and to position itself over it, thus avoiding their tangling up. The flexible structure of these stirrups is such as to allow the use of the invention also when the drum in which it is placed has a reduced diameter compared with the one foreseen.

The internal winglets and flexible tabs are instead adequate to help direct the wire toward the tubular trunk in the middle of the drum. Said wire is pulled from the outside and at the same time the winglets and flexible tabs avoid the coils at the top of the bundle - on which the invention is placed - to move excessively and to emerge from the same winglets and tabs.

In this way the bundle is forced to unwind in a correct way, and thanks to the light weight of the invention, which is normally made through a moulding process of plastic materials, without having to exercise a considerable pressure that would determine an excessive  
5 braking action on the wire pulled by the dragging group.

#### BRIEF DESCRIPTION OF THE DRAWINGS

More features of the invention and the advantages which it determines will clearly appear in the following description, which is  
10 referred to a preferred shape in its execution, however it is illustrated as a pure example which by no means is limiting, in the figures of the enclosed drawing, in which:

- fig. 1 is the layout view of the lower part of the invention;
- fig. 2 is the view along the AA section line of fig. 1;
- 15 - fig. 3 is the partial view along the BB section line of fig. 1;
- fig. 4 is the view on a different scale of a section of the drum with the invention inserted on it, sectioned with an axial plane.

However, it must be clear that the drawings and the corresponding described parts are given exclusively as the illustration of the  
20 object of the invention, without in any way constituting a limitation of it.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the drawings we have indicated with 1 the circular shaped  
25 crown structure, with 2 the stirrup shaped flexible elements, with 3



the shaped winglets, with 4 their external profile, with 5 the flexible tabs, with 6 the thin skeletons that connect the winglets 3 with the tabs 5, with 7 the drum, with 8 its central tubular trunk.

In substance, the invention consists in a device capable of carrying  
5 out a braking and containing action in the unwinding of the metal wire wound into a bundle and placed inside a containing drum 7, having a tubular center 8. The wire being used to feed welding machines and in particular those operating non stop (welding robots).

10 Said device operates a braking action on the movement of the coils at the top of the bundle that is being unwound. It consists in an element which can carry out a slight pushing action on the coils and is formed by a circular crown 1 having on its outer edge distributed stirrup shaped flexible elements 2, with a dimension that allows  
15 their adherence - bending inwards if necessary - to the internal surface of the drum 7 in which the invention is positioned. In this way it can stop the external parts of the coils from rising along the internal surface of the drum 7 and to go over the level of the pressure disk itself and as a consequence of the pulling action, the  
20 wire could move close to the tubular trunk 8 and create a knot on the disk 1 with the effect of stopping its normal flow.

On its inner edge the disk 1 is equipped with distributed guiding winglets 3 and flexible tabs 5. The former having the profile 4 of the side oriented towards the axis of the drum 7, connected to the  
25 thin skeleton 6 curved into a spiral towards the center of the same

drum, so that the wire of the bundle, when pulled, is evenly sustained and guided towards the center of the drum 7 to emerge from it staying adherent to the tubular trunk 8 against which it is pushed by the sequence of flexible tabs 5 that follow it as it  
5 unwinds.

The invention therefore carries out two actions, the first one consisting in a braking action that also regulates the movement of the coils at the top of the bundle, in fact said movement would be turbulent and disorganized without it. The second action is that of  
10 convoying the wire that unwinds making it emerge from the drum 7 in an almost axial direction as well as a rotatory one to follow the coils that unwind from the bundle.

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CLAIMS

1. A device for the braking of the unwinding of the bundled metal wire placed in a drum, especially designed for the feeding of welding machines, in particular those operating non stop (welding robots), having an automatic advancing movement of the wire constituting the soldering metal, constituted by a device having a circular crown shape (1) and characterized by jutting flexible elements (2) on its outer edge, whose size is made to allow adhesion, inflecting if necessary, on the inner surface of the drum (7) in which the bundled wire and the disk are placed, while on its inner edge it is characterized by guiding winglets (3) and by flexible tabs (5).
2. The device for the braking of the unwinding of the bundled metal wire placed in a drum, as claimed in claim 1., characterized by the fact of being a structure obtained through moulding and having stirrup shaped jutting flexible elements (2).
3. The device for the braking of the unwinding of the bundled metal wire placed in a drum, as claimed in claim 1., characterized by the fact that the shaped winglets (3) having the profile (4) of the side oriented towards the axis of the drum (7), connected to the thin skeleton (6) curved into a spiral towards the center of the same drum.
4. The device for the braking of the unwinding of the bundled metal wire placed in a drum, as claimed in claim 1., characterized

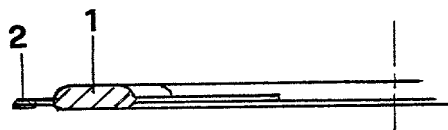
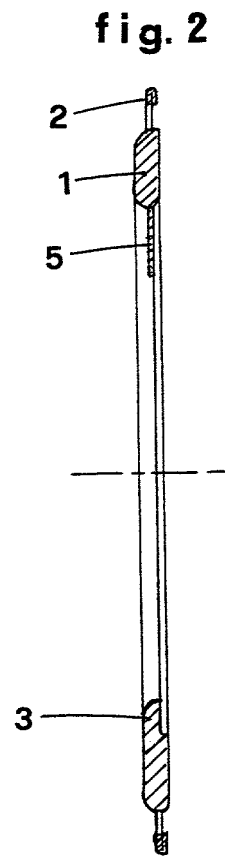
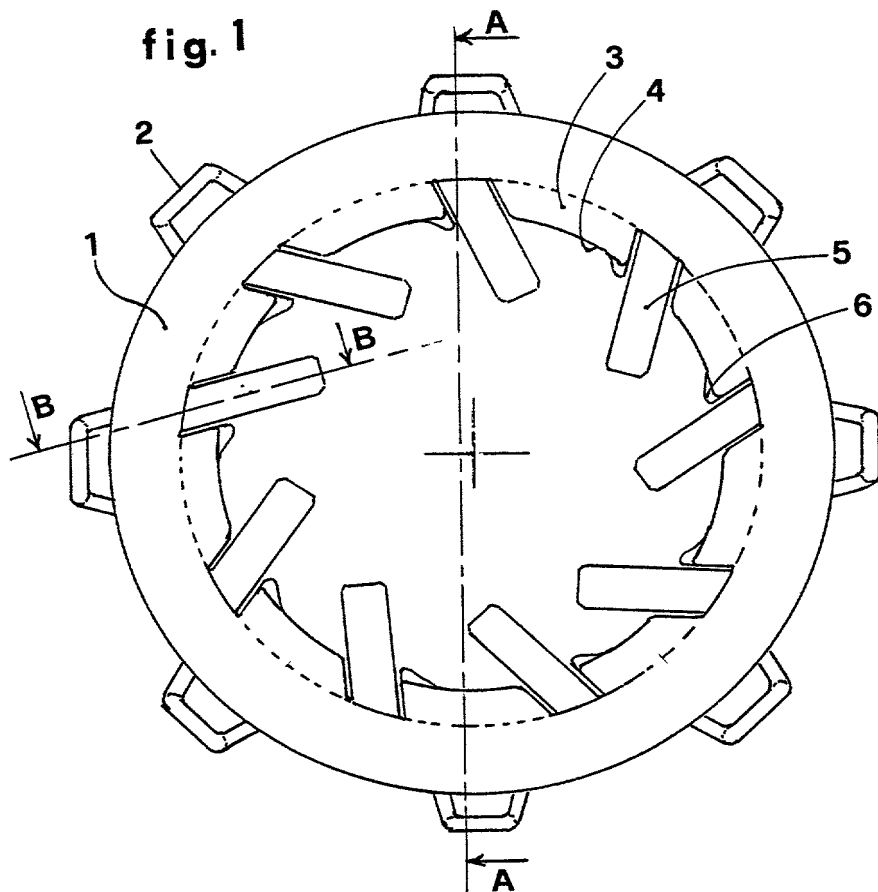


ABSTRACT

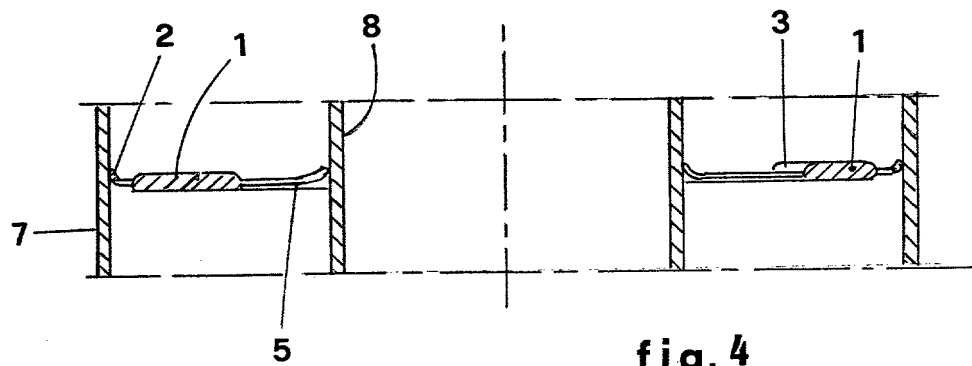
The invention consists in a circular crown shaped pressure disk (1), furnished with, on its external rim, jutting stirrup shaped, flexible elements (2) whose size makes them adhere, by eventually, inflecting, on the internal surface of the drum (7) within which the said disk is housed, on the internal rim it is equipped with winglets (3) and with flexible tabs (5) directed nearly tangentially in respect to the tubular trunk (8), placed at the centre of the drum (7), capable of stopping the rise of the bundle of coils so as to impede their knotting (between each other) and to help guiding the wire, as it is pulled to the outside of the drum and unwound from the bundle.

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**fig. 3**



**fig. 4**

**COMBINED DECLARATION AND POWER OF ATTORNEY**

As a below named inventor, I hereby declare that

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**MECHANISM FOR BRAKING THE UNWINDING OF A BUNDLE OF METALLIC WIRE IN A DRUM**

the specification of which: *(check one)*

**REGULAR OR DESIGN APPLICATION**

☒ [X] is attached hereto.

☐ [ ] was filed on \_\_\_\_\_ as application Serial No. \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

**PCT FILED APPLICATION ENTERING NATIONAL STAGE**

☐ [ ] was described and claimed in International application No. \_\_\_\_\_ filed on \_\_\_\_\_ and as amended on \_\_\_\_\_ (if any).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

**PRIORITY CLAIM**

I hereby claim foreign priority benefits under 35 USC 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

**PRIOR FOREIGN APPLICATION(S)**

Country	Application Number	Date of Filing (day, month, year)	Priority Claimed
ITALY	AR96A000022	24 July 1996	YES

*(Complete this part only if this is a continuing application.)*

I hereby claim the benefit under 35 USC 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)

(Filing Date)

(Status--patented, pending, abandoned)

POWER OF ATTORNEY

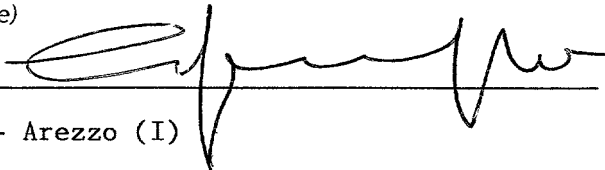
The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from \_\_\_\_\_ as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned.

As a named inventor, I hereby appoint the following attorney(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: **Robert J. PATCH, Reg. No. 17,355, Andrew J. PATCH, Reg. No. 32,925, Robert F. HARGEST, Reg. No. 25,590, Benoit CASTEL, Reg. No. 35,041, Eric JENSEN, Reg. No. 37,855, and Thomas W. PERKINS, Reg. No. 33,027, c/o YOUNG & THOMPSON, Second Floor, 745 South 23rd Street, Arlington, Virginia 22202.**

Address all telephone calls to Young & Thompson at 703/521-2297.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: **Giancarlo CIPRIANI**  
(given name, family name)

Inventor's signature  Date 10 April 1997

Residence: **Bibbiena - Arezzo (I)** Citizenship: **Italian**

Post Office Address: **11, Via Don Mazzoleni, I-52012 Bibbiena - Arezzo (I)**

Full name of second joint inventor, if any:  
(given name, family name)

Inventor's signature \_\_\_\_\_ Date \_\_\_\_\_

Residence: \_\_\_\_\_ Citizenship: \_\_\_\_\_

Post Office Address: \_\_\_\_\_

Full name of third joint inventor, if any:  
(given name, family name)

Inventor's signature \_\_\_\_\_ Date \_\_\_\_\_

Residence: \_\_\_\_\_ Citizenship: \_\_\_\_\_

Post Office Address: \_\_\_\_\_